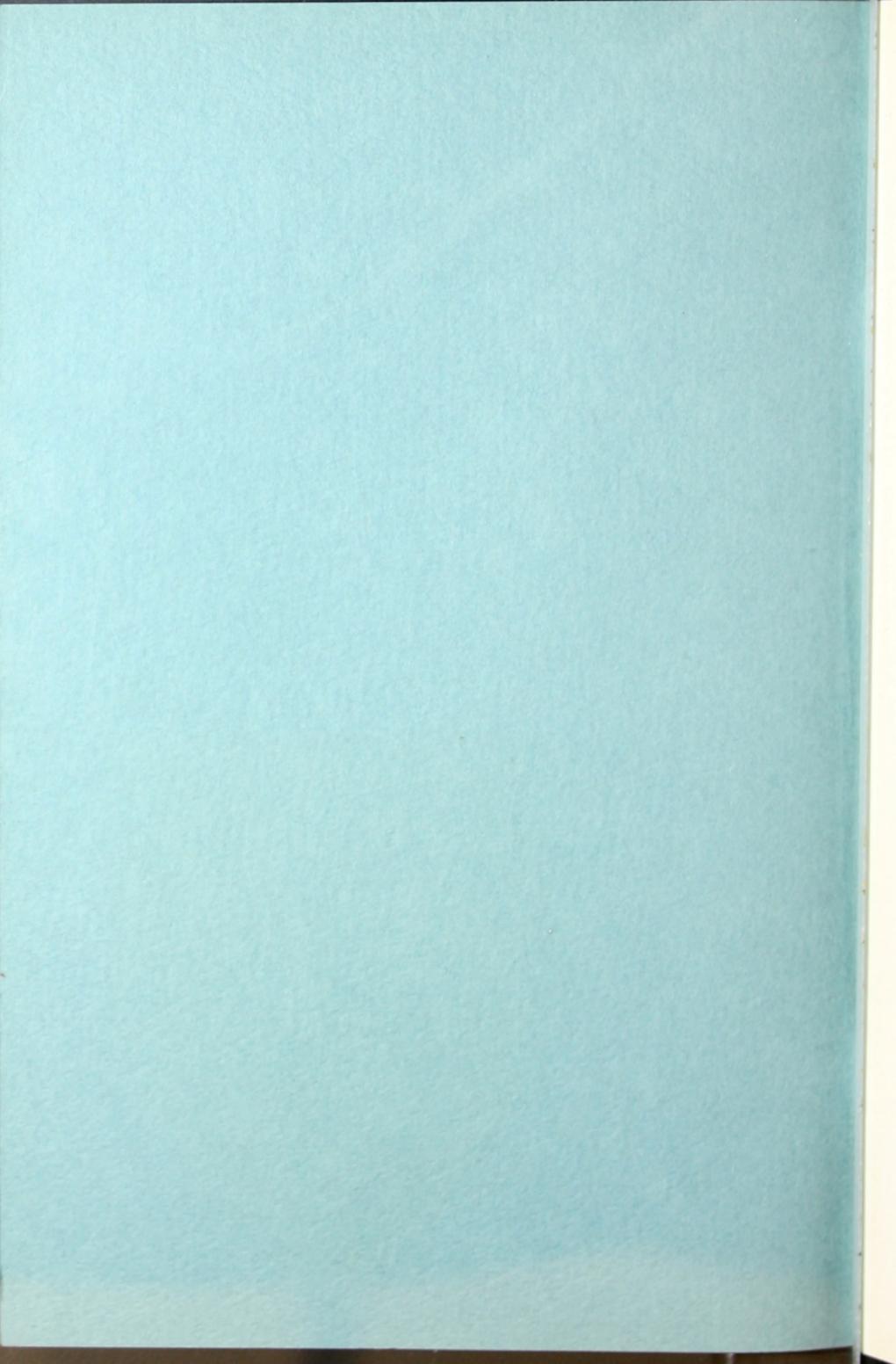


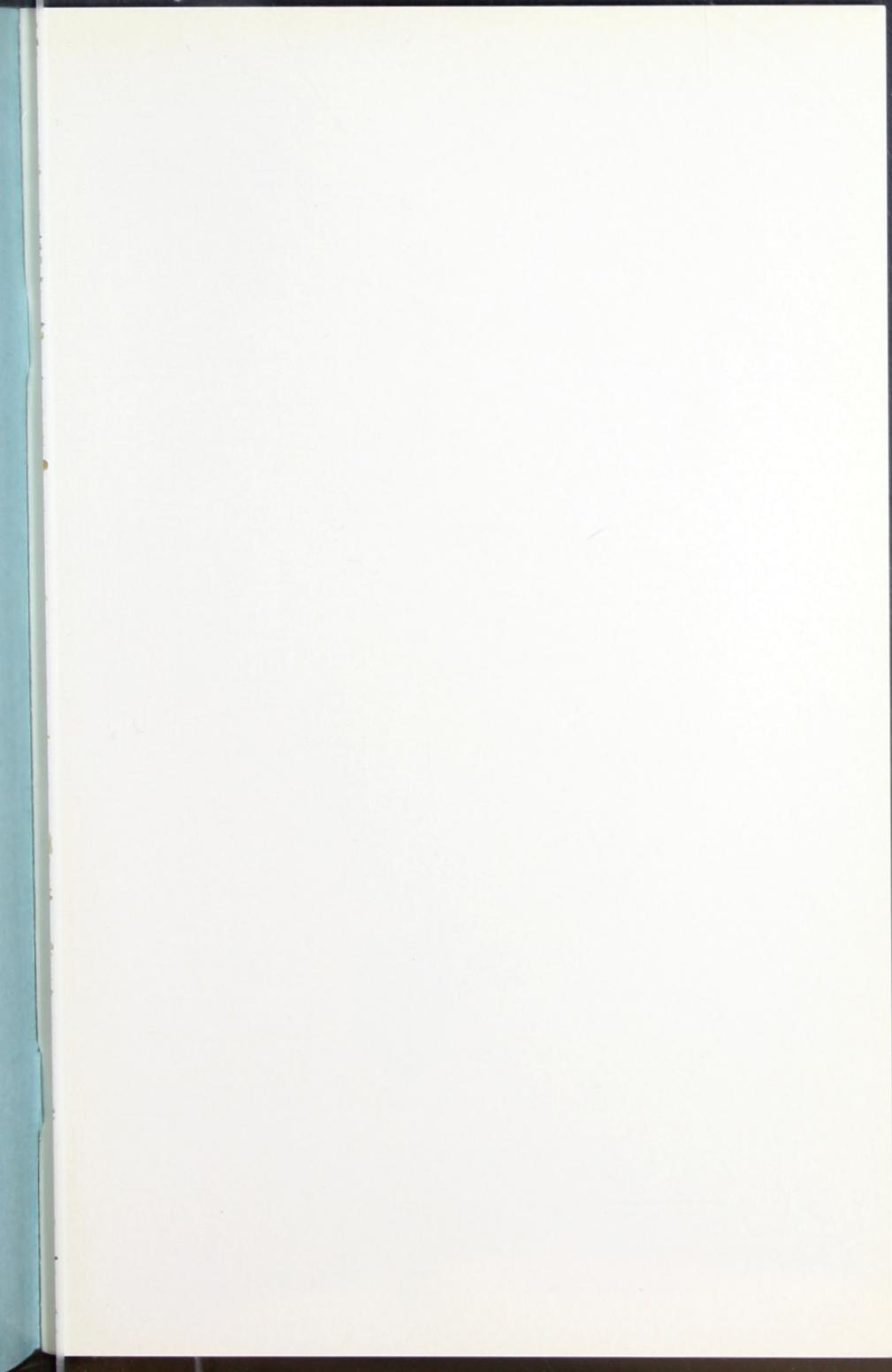
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ALUMINUM PAINT

ITS USES
AND
APPLICATION





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ALUMINUM

PAINT



THIN FLAT FLAKES
OF ALUMINUM
THAT OVERLAP
LIKE FALLING
LEAVES



ALBRON

ALUMINUM COMPANY
OF AMERICA
PITTSBURGH, PA.



ALUMINUM PAINT

The statements made in this book regarding the unusual advantages of aluminum paint apply only to paint prepared with a high quality aluminum pigment such as Alcoa Albron aluminum bronze powder or paste. Aluminum Company of America does not sell paint. But the better grades of aluminum paint, which consist of Alcoa Albron Powder or Paste and a suitable vehicle, can be furnished by most reputable paint manufacturers, jobbers and dealers.

Thousands of tests conducted by the Aluminum Research Laboratories of Aluminum Company of America, years of study and scientific investigation and actual commercial experience are the basis of the statements made in this book. Detailed information on these tests is available if requested.

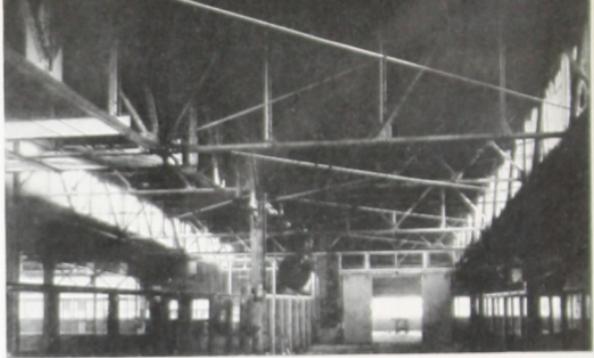


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CONTRAST—Two photographs of the same interior view taken before and after aluminum paint was applied. In order to measure the true effect that aluminum paint has on illumination, the pictures were taken with the same camera and same exposure; both negatives and prints were given the same development. The view is a corner of the American Austin Plant, Butler, Pa.



INDOORS—A single coat of aluminum paint made a marked improvement in illumination at the Erie Works of the General Electric Company.



OUTDOORS—Many industrial exteriors, like this grain elevator owned by Butler-Welch Grain Company, Omaha, Nebr., are protected and beautified with aluminum paint.

WHY ALUMINUM PAINT DIFFERS FROM OTHER PAINTS



ALBRON

The pigments of ordinary paints are fine particles in granular form. Alcoa Albron, the aluminum paint pigment manufactured by Aluminum Company of America, is wholly different from ordinary pigments—in form, action and result. When mixed with a suitable vehicle, (i.e. varnish), the tiny flat thin *flakes* of pure aluminum make possible the advantages found only in this type of paint.

"LEAFING"

As aluminum paint is brushed or sprayed on wood, metal, concrete—in fact, any surface, many of the tiny metallic flakes held in the vehicle, rise to the surface of the paint coating to form a "leafed" film. They lie upon one another, just as falling leaves pile together.

"Leafing" is most useful. It gives aluminum paint much of its durability and moisture-proofing qualities, its power of reflecting light and heat, its resistance to smoke and fume, its hiding power. The flakes overlap

to form a film that is in truth a lustrous sheath of pure metal that is protective, handsome and durable.

REFLECTIVITY

One would expect a paint whose pigment is composed of flat, bright metallic flakes to reflect light. In practice it has been found that an aluminum-painted surface reflects between 60 and 70 per cent of the total light falling upon it. The light is scattered in all directions, making aluminum paint useful for brightening up interiors or for making objects more easily visible. Used on the exterior of tanks or on the roofs of buildings, aluminum paint reflects sunlight and heat, keeping interiors cooler.

HIDING-POWER

If a sheet of metal, no matter how thin, is put over any surface, it will, of course, completely hide that surface. Therefore it is not surprising to find that a paint made with a pure aluminum pigment has the ability to completely obscure or hide any dark-colored surface. The comparative hiding-power may be tested by covering part of the surface with aluminum paint and part with other kinds of light-colored paints. When compared with other coatings ordinarily used for interior or "brightening-up" purposes, the aluminum paint will invariably have the better hiding-power, because it "leafs."

Asphalt-covered surfaces are easily hidden with a single coat of this paint, and it is frequently used to eliminate the bleeding tendency of asphalt and bituminous coatings. This superior hiding-power of aluminum paint is also very useful in covering age-darkened walls and other dark-colored surfaces. If it is properly and uniformly applied, it will completely hide

the under-color in one coat. This makes the paint a most economical kind, not only from the standpoint of material used, but also from the standpoint of the labor required to apply it.

DURABILITY

Much scientific work has been done to discover what makes paint fail. It is a well-known fact that sunlight penetrates ordinary paint films and is the chief factor in the breakdown of vehicle.

The metal flakes of Alcoa Albron Powder and Paste stop and reflect both visible and ultra-violet light. Because of their "leafing" action, they not only build a "roof" of metal over the film but also arrange themselves in successive parallel layers throughout the vehicle giving continuous protection as the surface slowly weathers away. In this manner, the vehicle is covered up—protected from the destructive rays, and as a result, the paint lasts much longer. These facts also explain why the mixing of fillers or extenders such as mica with aluminum pigment shortens the paint's life. Aluminum paint is at its best, therefore, only when it is made with a pure pigment.

MOISTURE-PROOFING POWER

The ability of aluminum paint to resist moisture is also an important factor in determining its durability and protective power. In tests of all kinds and under many different conditions, the moisture-proofing power of aluminum paint is among the highest obtainable with practical surface coatings. For this reason, aluminum paint is being used more and more as a priming-coat on wood, as a protective coat for steel structures, and as an interior finish, especially where moist atmospheres are encountered.

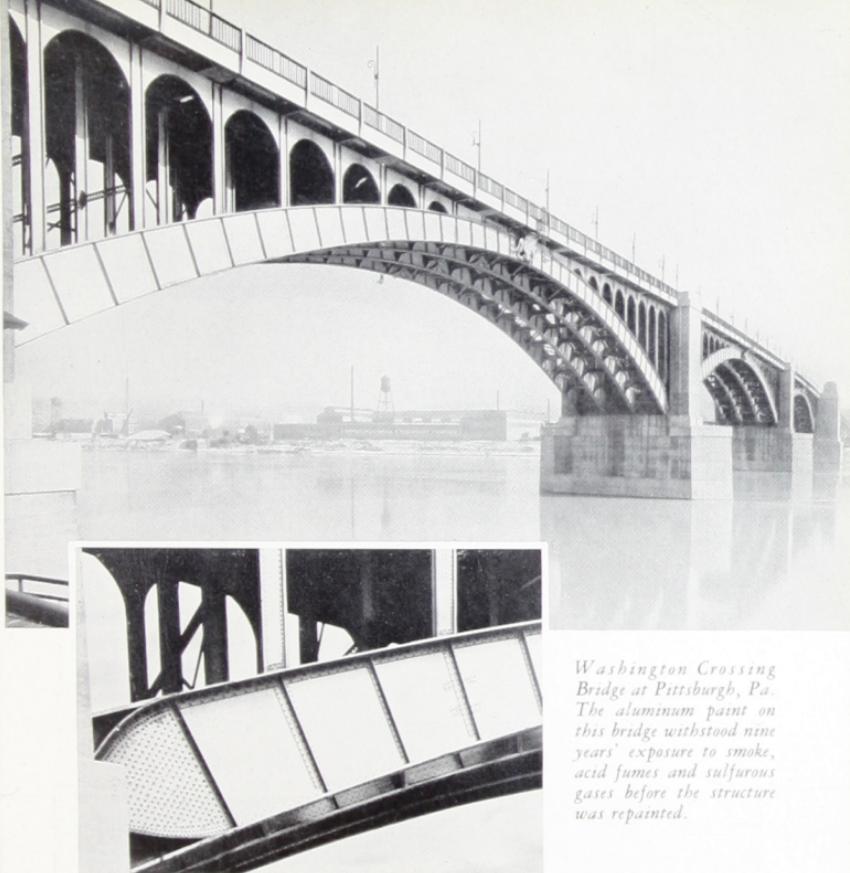
HOW TO SECURE THE BEST RESULTS WITH ALUMINUM PAINT



Aluminum paint, in order to give maximum service and durability, must contain a properly manufactured pigment. Be sure to specify Alcoa Albron Powder or Paste as the pigment portion of all aluminum paint purchased. It is often stated on the paint container that the pigment portion is Alcoa Albron.

Most reputable paint manufacturers are in a position to supply aluminum paints suitable for application on all types of surfaces, employing the correct vehicle and using Alcoa Albron as the pigment. It is furnished in double containers, in separate packages of vehicle and pigment, or in the ready-mixed form. Not all ready-mixed aluminum paints retain their color and brilliancy or afford the same durability as paints so packaged that they may be mixed as required. Accordingly, in purchasing a ready-mixed aluminum paint, be sure that the product is backed by a reputable guarantee to the effect that the paint will offer satisfactory brilliance and durability.

The recommended proportion of pigment to vehicle varies with the grade of powder or paste employed, as well as with the type of surface to be painted. The specifications on pages 53 to 61 give the mixing



Washington Crossing Bridge at Pittsburgh, Pa. The aluminum paint on this bridge withstood nine years' exposure to smoke, acid fumes and sulfurous gases before the structure was repainted.

(Inset) Close-up of one of the Arch Members of the Washington Crossing Bridge. This photograph taken in May, 1933, shows the excellent condition of the aluminum paint after nine years' exposure.

proportions of pigment to vehicle found to be most satisfactory. These specifications also describe the vehicles required for best results.

VARNISH VEHICLE

Varnish vehicles for aluminum paint are of almost universal application. Varnishes in general are made from heat-treated drying oils in combination with various varnish gums, both natural and synthetic. Some of the newer varnishes, which combine rapid drying time with high flexibility, moisture- and

weather-resistance are made from synthetic resins produced by complex chemical processes.

A varnish vehicle for aluminum paint for exterior use should be of the long oil type, that is, the proportion of oil to gum should be sufficiently high to give a varnish of good elasticity with satisfactory hardness and drying time. The well-known spar varnish is a long oil varnish but, in general, the varnishes used for aluminum paint are even more elastic than the average spar varnish. Long oil varnish vehicles for aluminum paint are supplied by manufacturers for use on weather-exposed steel and both interior and exterior brick, concrete, stucco and plaster.

For priming wood with aluminum paint, a varnish having exceptionally high elasticity is recommended as the vehicle. Such a vehicle may be described as a *very long* oil varnish to distinguish it from the long oil varnishes previously referred to. It should possess the



Hialeah Race Track, Miami, Florida. Brooks-Scanlon Corp., Foley, Florida, furnished 10,000 feet of lumber primed with aluminum paint.

necessary elasticity for maintaining satisfactory adhesion to wood, together with desirable moisture-proofing qualities and satisfactory drying time. Although its chief use is as a priming coat vehicle for wood exposed to the weather, it may also be used for top coats that give a surface finish of unexcelled durability.

ASPHALT OR BITUMINOUS VEHICLES

The better grades of bituminous and asphalt paints usually consist of pitch or asphalt combined with suitable thinners and may contain drying oils and gums. When these dark-colored vehicles are mixed with a leafing aluminum pigment, the resultant paint produces a brilliant aluminum-colored surface. The valuable properties of such paints make them particularly well adapted to many special surfaces where varnish vehicles cannot be satisfactorily used.

LACQUERS

The modern lacquers largely consist of nitro-cellulose, gums, and plasticizers dissolved in suitable thinners. For many uses they have been found to be quite tough and durable. Aluminum powder may be used satisfactorily with vehicles of this type where a rapid drying finish is required, as in painting various small articles on a production scale. Usually their cost is somewhat higher than that of oil-base vehicles.

HEAT-RESISTING VEHICLES

Heat-resisting vehicles may contain a wide variety of materials, but they are usually of the gloss oil type. Aluminum paint made with these vehicles may be applied to metal surfaces which are to be heated, with-

out fear of destroying the paint film. However, these paints are rather brittle in nature and cannot be expected to show much durability on outdoor exposure. They are, therefore, not to be recommended for stack painting. Their use should be largely confined to furnaces, piping, etc.

SPECIAL VEHICLES

Besides the vehicles already mentioned there have been and are being developed numerous vehicles so varied in their characteristics that it is impossible to describe them briefly. Many of these have valuable qualities for certain purposes. Each, however, should be investigated for its merits and its adaptability to any particular use.

ALUMINUM PAINT ON STEEL

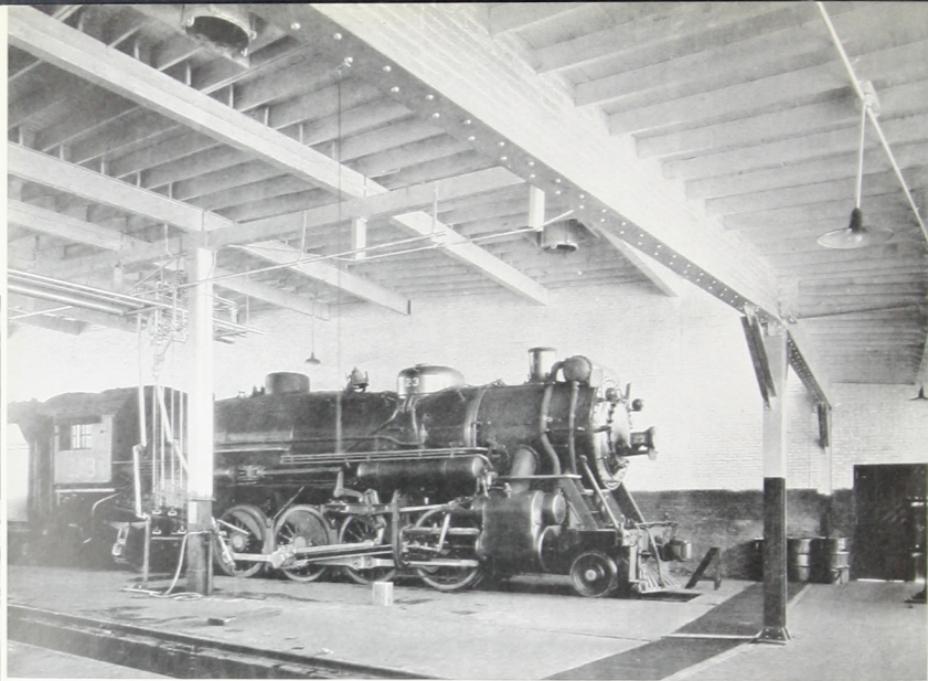
Aluminum paint serves as an unusually good priming coat for wood and may be used successfully as a first coat on steel. However, it has been found that under severe exposure conditions better results are obtained if a high-grade inhibitive primer is used on the steel before the aluminum paint is applied.

ALUMINUM PAINT IS FILLING A WIDE INDUS- TRIAL NEED » » »

The several industries covered in the following pages do not offer a complete picture of the diverse uses of aluminum paint. Each industry has its own individual, specific problems and needs. Those mentioned here are just some examples that illustrate the many possible applications of the "coat of metal protection."

Outdoors or indoors—on almost every type of surface: wood, metal, concrete, plaster—on machinery, tools, tanks, towers, fences or on structures of all sorts—for protecting and brightening, aluminum paint fulfills practically every painting need. Probably no other single paint meets as many requirements. Certainly no ordinary paint can give some of the results obtained through the use of this "Coat of Metal Protection."

Many manufacturers and plant owners have proved the value of aluminum paint. They insist upon its protection to their investments in plants and equipment. They have found that its bright, lustrous film makes general lighting conditions better. They know the easy washability of this metallic coat, have seen its long life through temperature changes, moisture, steam, smoke and acid fumes.



Aluminum paint applied to the interior of Detroit & Toledo Shore Line R. R. roundhouse to protect it from sulfurous fume and to improve lighting conditions.

RAILROADS

ROUNDHOUSES.. SIGNALS.. ROLLING STOCK

★ Railroad structures, roundhouses and shops, put paint to the most relentless, destructive, day-in-and-day-out tests. Here are concentrated blasts of steam, sulfurous fume and smoke—the enemies of paint.

Ever in search of lowering upkeep costs, railroad officials quickly put to test the benefits of aluminum paint. Today you will see it along right-of-ways—on signal towers, water tanks and transmission towers. Where every aid to vision is vital, the high reflectivity of this metallic paint has proved invaluable.

Steel bridges and other right-of-way equipment which are constantly subjected to smoke fumes, re-

ALUMINUM PAINT

THE COAT OF METAL PROTECTION

quire the super-protection of aluminum paint. Sulfurous gases are checked by this film. Steel and iron have a much longer usefulness; repainting jobs are fewer. Wherever used, this attractive gleaming finish has a strong appeal. It is a fine advertisement to passengers that suggests extra care, progressiveness and prosperity.

Used inside the roundhouse, shops, freight houses and supply rooms, aluminum paint greatly improves the general lighting when used on walls, ceilings and doors. In the painting of rolling stock, this protective film not only cuts down paint costs, but is generally efficient. For refrigerator cars, dining car kitchens, live-stock cars, it is a general aid to sanitation; it can be repeatedly washed down, and retains its silvery sheen through long, hard service. Used as a priming coat for all wood structures, it gives substantial and durable protection to the wood.

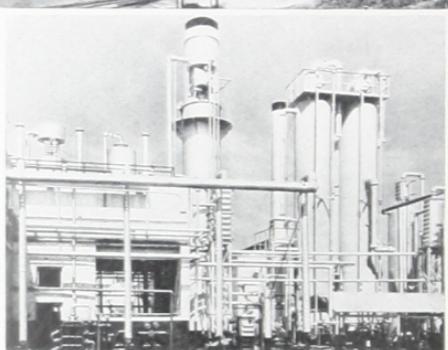
For decorating waiting-rooms of passenger stations, aluminum paint is both a serviceable and attractive finish. Furthermore, it is economical. One coat, on any kind of a surface, is usually enough to hide any under-color. See "Interior Decoration," page 43.



Signal posts of Texas and Pacific R. R. made highly visible and protected from the elements by aluminum paint.



Aluminum paint reflects the sun's heat from the Merchants Dispatch Refrigerator Line Cars.



Hancock Oil Co., Long Beach, Calif.,
tank farm and equipment painted
with aluminum paint.

O I L

STORAGE TANKS... REFINERY EQUIPMENT... TANK CARS

★ Besides the unusual protection against rust and corrosion given by aluminum paint to metal surfaces, the oil industry makes use of another one of its properties —namely its ability to reflect heat.

As mentioned before, aluminum paint reflects the hot rays of the sun. Applied to oil tanks, aluminum paint keeps their contents cooler and so reduces loss from evaporation. Millions of barrels of gasoline are saved yearly through the use of this bright metallic paint. Anyone acquainted with the production or refining of oil knows how extensively this industry depends upon aluminum paint. Scientific tests and practical experience have proved to oil men that, in the long run, it is the most economical paint to use.

The U. S. Bureau of Mines has demonstrated this fact in an interesting series of tests (Serial No. 2677).

ALUMINUM PAINT

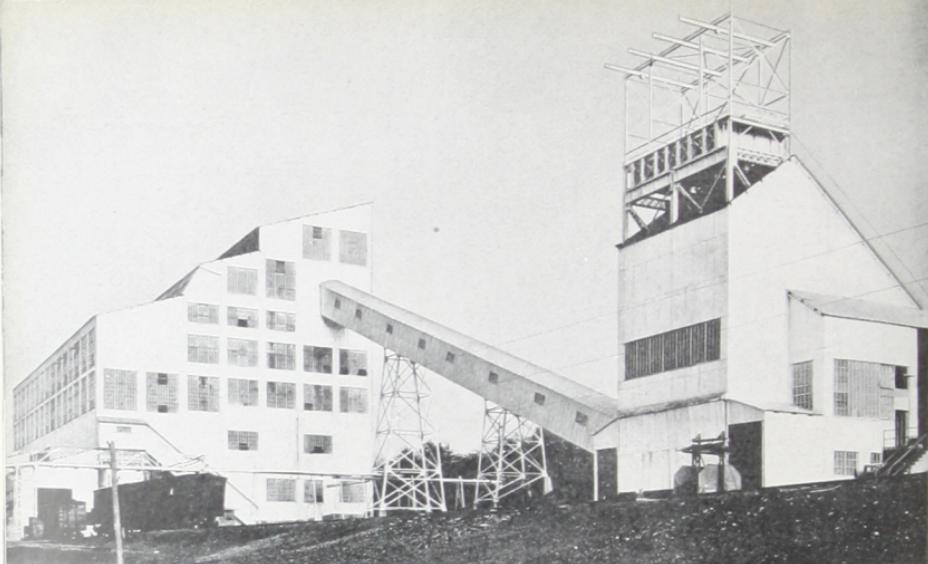
On the huge 80's in the fields and on other equipment used for the production, storage, refining and transportation of oil, aluminum paint is providing a real ally to conservation. Railroad tank cars protected with aluminum paint are better carriers of oil and gasoline, because more of the product reaches its destination—fewer gallons are lost by evaporation.

The fact that aluminum paint resists the action of hydrogen sulfide and other corrosive fumes present in sour crudes is an added reason for its use on all sorts of equipment in the oil industry. Not only does aluminum paint hold its color in the presence of hydrogen sulfide, but if made with the proper vehicle the paint will prove to be a most durable coating for all types of structures. Again, this protective quality results from the paint's metallic pigment which is, itself, highly resistant to sulfur and sulfur compounds.

Aluminum paint is also gaining popularity in the marketing division of the oil industry. It is used on bulk storage tanks to reduce evaporation and preserve the equipment, and it is being used more and more to give a distinctive appearance to service stations.



Quaker City Tank Line, Inc., St. Louis, Mo., coats its cars with aluminum paint.

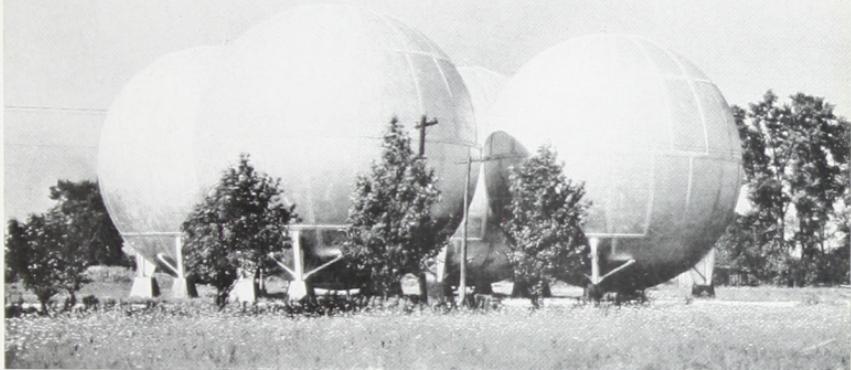


Underwood Breaker of The Pittston Co., Throop, Pa., coated with aluminum paint for protection and better appearance.

COAL BREAKERS..PIPE LINES..STEEL TOWERS..UNDERGROUND ROOMS AND STRUCTURES

★ Used as an exterior finish on collieries and other coal mine surface buildings, pipe lines and towers, aluminum paint changes the customary drab appearance of these structures to one having a distinctive metallic luster. Buildings so painted have a greater advertising value because they indicate a well-kept and prosperous mine. Maintenance engineers also appreciate the economies obtained with aluminum paint. Besides retarding the weathering of wood and the formation of rust, it is itself long-lived and economical.

For economy and lasting good appearance, aluminum paint is unsurpassed for houses and other buildings in company-owned towns. It has been used on entire villages for both priming and finish coats on wood construction. (See illustrations on pages 50 and 51.) Its durability and hiding quality makes aluminum paint particularly applicable for repainting where only one coat is desired.



Aluminum paint adds to the appearance of Hortonspheres as well as other types of fuel gas holders.

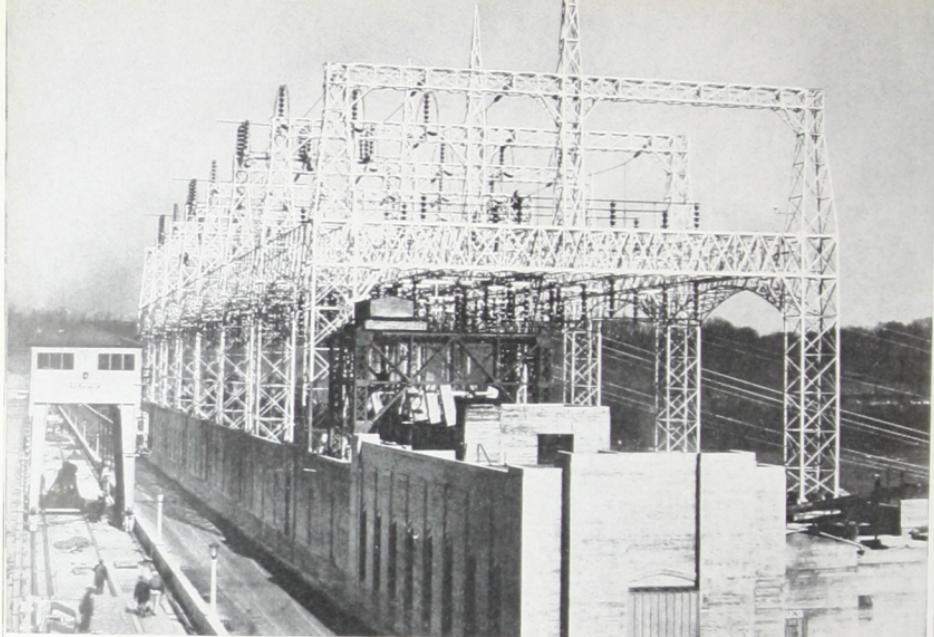
GAS

PRESSURE TANKS..PIPE LINES..
BUILDINGS

★ Many of the same advantages which have made aluminum paint so necessary in the oil industry hold true for gas plants. It proves a definite economy at every step.

Used on pressure storage tanks, this metallic film helps save the gas itself—cutting down losses from blow-off valves in hot weather. For, it reflects heat from the sun—keeps tanks cooler, reduces temperature and pressure changes.

Furthermore, metal tanks, and other gas plant equipment need this protection against hydrogen sulfide and other gases. Aluminum paint checks rust and corrosion and preserves the life of steel. It improves general appearances a hundredfold. Yet, gallon for gallon, aluminum paint, with all of its superior qualities, costs no more than other good paints.



Philadelphia Electric Company specified aluminum paint for this switching structure at Conowingo Dam, Conowingo, Md.

ELECTRIC POWER AND LIGHT CENTRAL STATIONS.. SUB-STATIONS..TRANSMISSION LINE TOWERS

★ To purchasing men for many central stations, aluminum paint long ago ceased to be an experiment; its use has become a standard specification. It is rapidly replacing other types of paint on transmission towers, on exposed transformer boxes and other similar units. Why?

Because this efficient coating of pure aluminum resists moisture and corrosion; it successfully fights the destructive ultra-violet rays of sunlight; it is a secure defense against sulfurous fume or smoke; it defers the time for repainting; it curtails general upkeep expense.

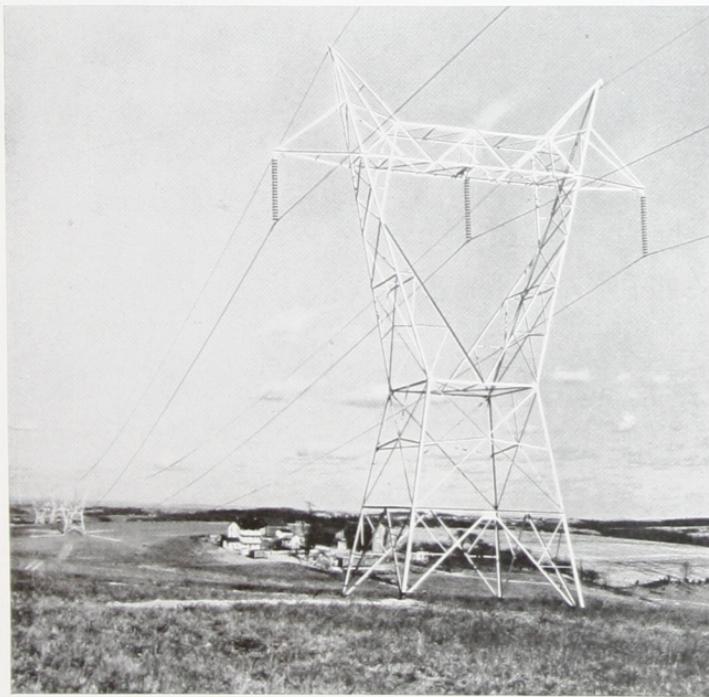
ALUMINUM PAINT

THE COAT OF METAL PROTECTION

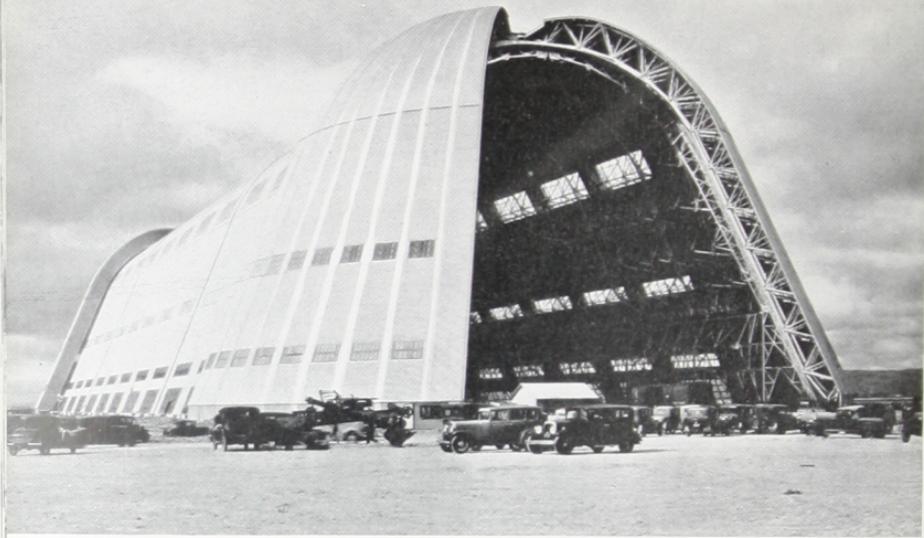
As a matter of fact, you won't have to search far to find innumerable proofs of the economy of this paint.

Then again recall the ugly colored structures which used to characterize substations! Today, these structures gleam with a lustrous, crisp beauty that goes a long way in creating a favorable public impression. It also adds to the important factor of visibility.

Manufacturers of electrical equipment have put themselves enthusiastically back of aluminum paint, for decorating and protecting fuse boxes, meters, switch panels, and all sorts of instruments. In their own plants, this modern coating is used as an interior finish—adding greatly to lighting efficiency.



Aluminum is the standard finish for practically all transmission line towers.



U. S. Navy Dirigible Dock, Sunnyvale, Calif., painted inside and out with aluminum paint. A million board-feet of mill-primed lumber was used in its construction.

A V I A T I O N

AIRCRAFT...HANGARS...FACTORIES

★ Both visibility and protection are vitally important in the field of aviation. On the planes, themselves, aluminum paint has long been accepted as standard protection to wings and to wood and metal parts. But, its use has widened extensively. Today many hangars and markers at airports are so painted. The aluminum paint coat stands out and is visible to the aviator miles away.

This paint is also easy to use for "touching up" surfaces. Inasmuch as the new application blends readily with the old, a complete repaint job is not necessary from the standpoint of appearance.

As a coating for fabrics used on wings and fuselages of planes and in the covering of rigid airships, aluminum paint has the choice. It preserves the material

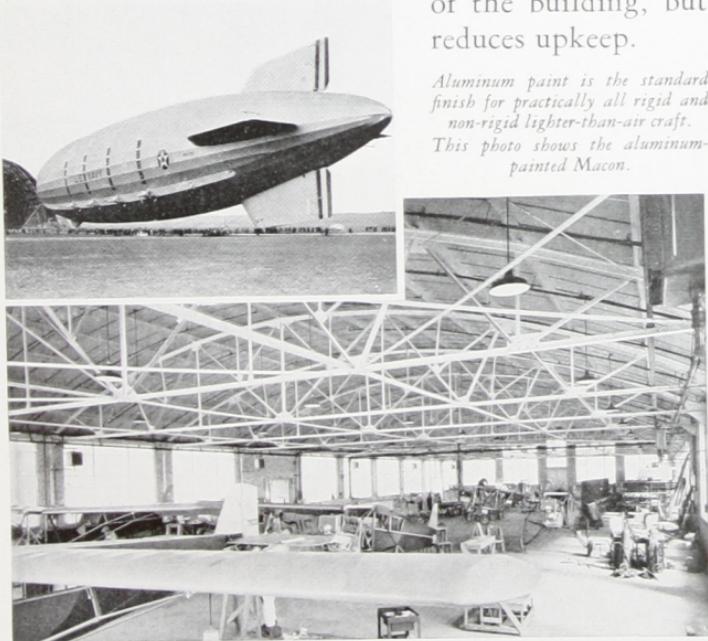
ALUMINUM PAINT

THE COAT OF METAL PROTECTION

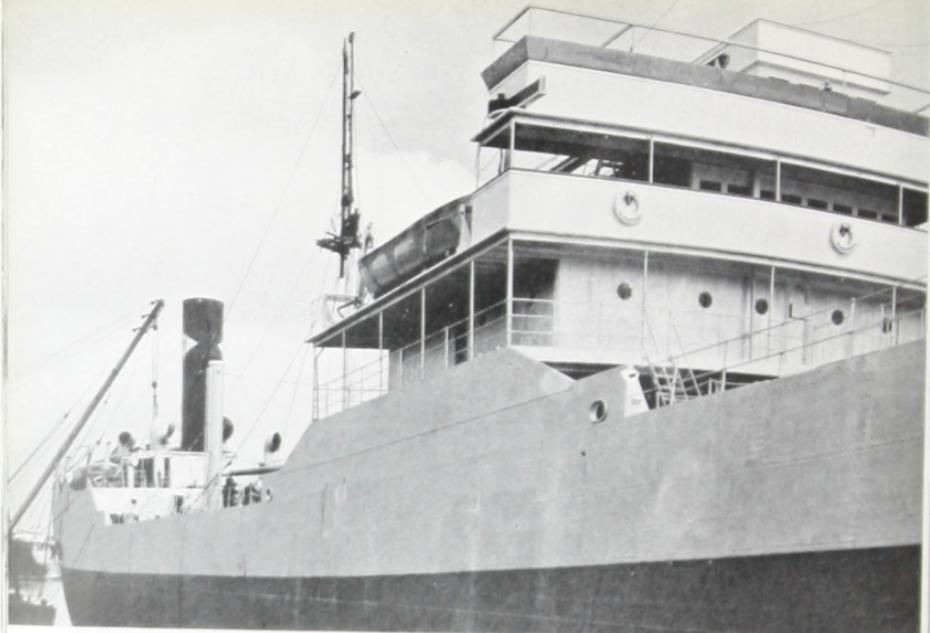
because its bright surface turns back the sun's harmful rays. Furthermore, it reflects the sun's heat and reduces temperature changes in the gas cells—hence stabilizes the buoyancy of lighter-than-air craft.

Manufacturers who have found aluminum paint valuable for their products are also drawing upon its qualities for their factories. When used as a finish coat for interiors, it improves working conditions because it is an aid to illumination; it gives the plant a bright, clean appearance. Aluminum paint is also a durable and attractive finish for all outside steel work. It protects metal against rust and prolongs the life of the equipment. Its advantages as a priming coat on wood are well-known. The moisture-proofing ability given to the paint by its metallic pigment minimizes warping and checking of the wood, which not only preserves the appearance of the building, but reduces upkeep.

Aluminum paint is the standard finish for practically all rigid and non-rigid lighter-than-air craft. This photo shows the aluminum-painted Macon.



The aluminum-painted roof trusses and ceiling of the Curtiss-Wright Airplane Company's Robertson, Mo., plant reflect an evenly distributed light over the entire working area.



All equipment above the waterline on the Tanker Mevania, owned by C. D. Mallory S. S. Co., is protected with aluminum paint.

MARINE INDUSTRY

MERCHANT MARINE..NAVAL CRAFT..DOCKS

★ The Marine Industry is an excellent place to determine the protective value of paint coatings. The requirements are generally more rigid than those for use ashore. Ship operators have tested aluminum paint under the continuous punishment of the elements and have found it to be seaworthy.

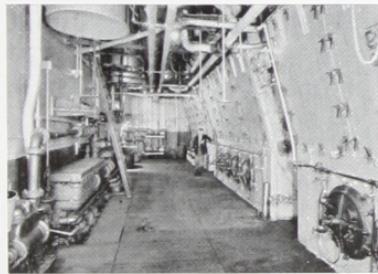
Above decks where paint is lashed by gales, stung by salt water and baked by strong sunlight, aluminum paint serves extraordinarily well. It has been found economical for all exterior surfaces, including hulls, above the water line. Boats protected with aluminum paint require fewer repaintings to keep them in good condition and good appearance. Some well-known

ALUMINUM PAINT

THE COAT OF METAL PROTECTION

ship companies paint their tankers and freighters inside and out with aluminum paint. Used on engine rooms, fire rooms, cargo holds and companion ways this bright metallic coating increases illumination, wears longer, and is readily washed. It is easy to apply and costs no more than other good paints.

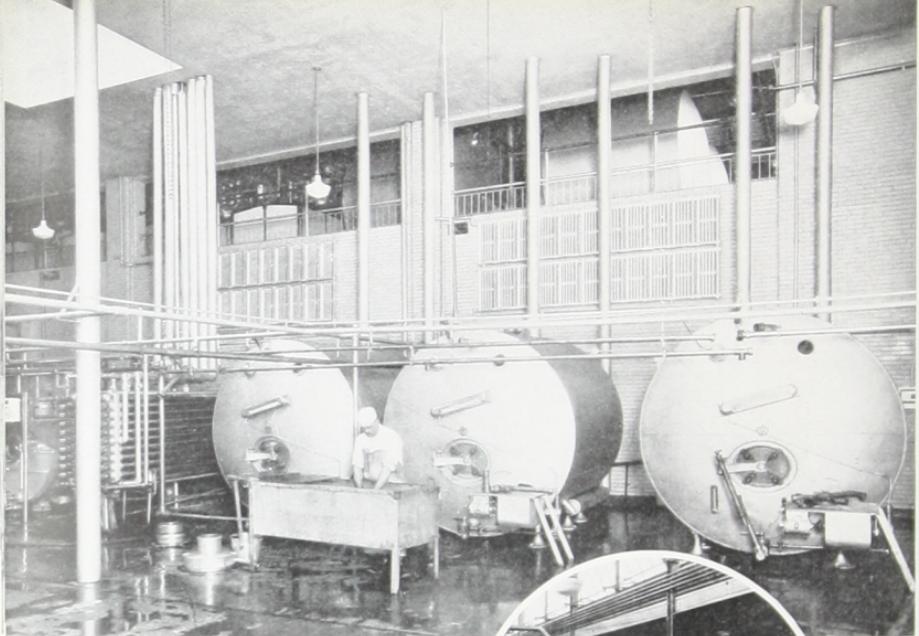
Piers, dry docks, warehouses and other shore line structures are maintained economically whenever aluminum paint is used. After making a series of tests using 10 different paints, the Board of Commissioners of the Port of New Orleans selected aluminum paint for the steel foundations of the New Orleans docks. The foundation is under water approximately 10 months of the year.



Fire room of the S. S. Black Falcon owned by Black Diamond S. S. Co. Aluminum paint is used on all 14 vessels owned by this company.



Clyde Mallory Steamship Co., Pier 34, North River, New York City, largest pier on the seaboard. The entire interior is finished with 2 coats of aluminum paint.



The Bouman Dairy Co., Chicago, coats exterior surfaces of exposed piping and equipment in its pasteurizing and bottling plants with aluminum paint.

In keeping with the extreme cleanliness found throughout the entire plant, the H. J. Heinz Company specified aluminum paint for these toasting ovens.

F O O D

CANNERIES..BAKERIES..CONFECTIONARIES
ICE CREAM PLANTS

★ Certain qualities of aluminum paint which are of slight interest to the industries just discussed are highly valuable to the Food Industry.

Aluminum, to the housewife, has long been known as the standard, safe metal for her pots and pans. Aluminum paint has this same value, for it is composed only of pure aluminum and a vehicle.

Food manufacturers, packers, and others handling

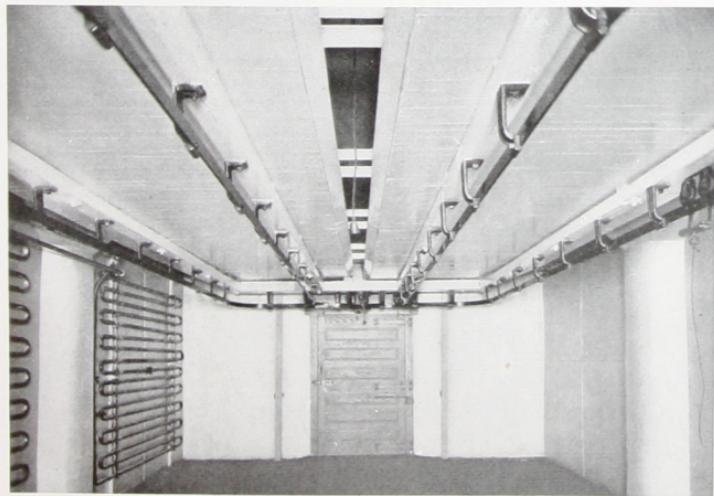
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THE COAT OF METAL PROTECTION

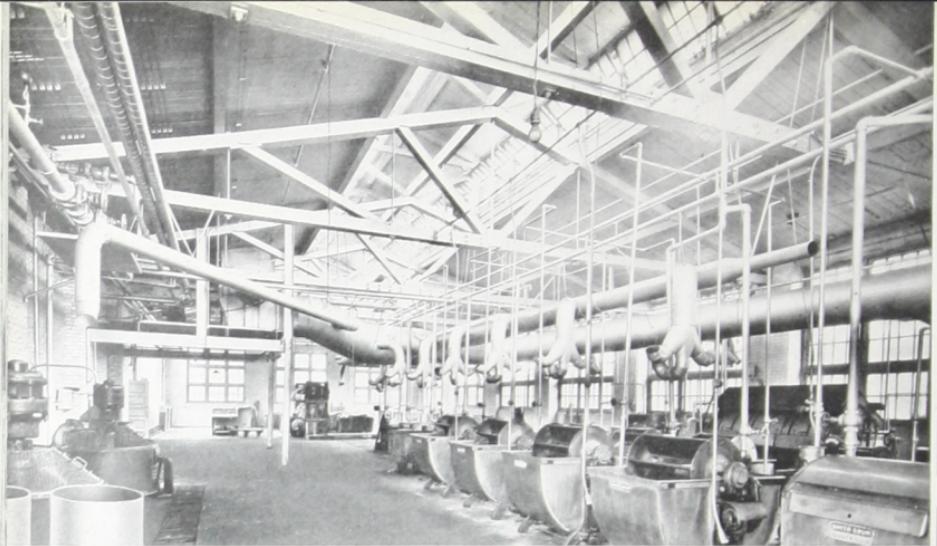
perishables, rely upon aluminum paint because it is harmless and will not contaminate food. Where every sanitary precaution is necessary, such a paint is invaluable. Wherever painted surfaces come in contact or are near delicately flavored foods, this protecting film is needed.

Aluminum paint is also an aid to cleanliness, for it can be washed down often without injuring the film or luster. The light-reflecting ability of this paint also increases the general illumination inside—makes better working conditions.

Another reason for its use is its resistance to moisture. In cooking rooms, dairies, and ice cream plants, this paint remains unaffected through long usage. In refrigerator rooms, aluminum paint can be applied directly over bituminous or asphalt paints. It prevents the "bleeding through" of stains and one coat, properly applied, will hide any under-color—even black. It is also used in pickling rooms because of its high resistance to acetic acid fumes.



Freezer Room of Mutual Sausage Co., Chicago, painted with aluminum paint.



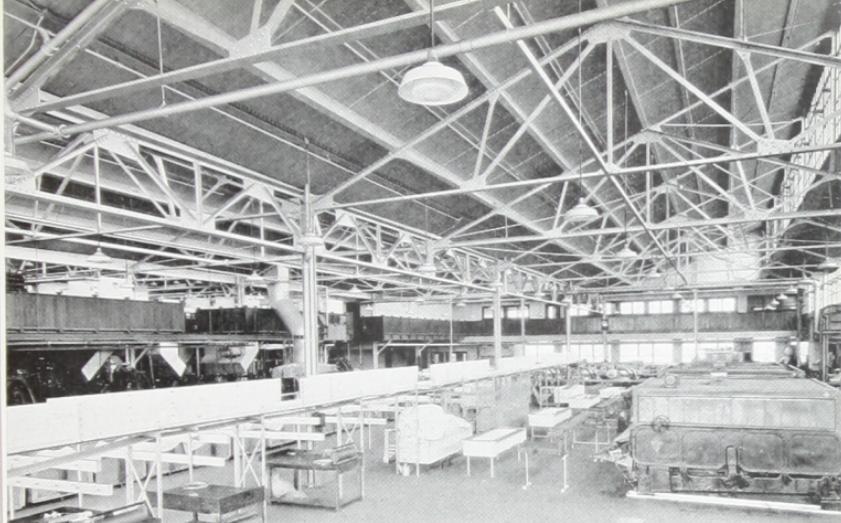
Dye House of the Cambria Hosiery Company, Philadelphia, painted with aluminum paint.

T E X T I L E S

DYE HOUSES.. WEAVING ROOMS.. COMPANY VILLAGES

★ Aluminum paint is the one "all-round" paint. In the textile field, it meets many strenuous tests—chief of which, perhaps, is its capacity for resisting the action of fumes and gases in dye houses and moisture in weaving rooms; plus the important advantage of its extra visibility in loom and spindle rooms. The light it reflects is soft and effective.

Then, again, the textile mills make wide use of this gleaming coat on structures out-of-doors—on tanks and towers, metal window frames, fire escapes and fences. Company-owned towns find this paint invaluable as a general protective coating on houses. Manufacturers have proved to their own satisfaction that aluminum paint delivers greater service per gallon, yet costs no more. Over a period of time, the actual savings effected are many. Furthermore a plant that is attractively painted has a real advertising value which should not be overlooked.



This fine plant, the Morey La Rue Laundry, is painted throughout with aluminum paint.

LAUNDRIES BUILDING INTERIORS . . MACHINERY

★ The condensation of moisture on ceilings and overhead pipes is often a serious handicap to the production of good laundry work. Drops of water that fall on clothing may leave dirty spots or stains.

It has been found that aluminum paint on such surfaces minimizes and even eliminates the formation of drops of water large enough to fall off. One laundry applied a single coat of aluminum paint and found that the formation of water drops was somewhat reduced, a second coat reduced it further and a third coat stopped it entirely. Although moisture still condensed on the painted surface, it did not form in large drops.

Such a painted surface is also easy to keep clean and will stand repeated washings before repainting is necessary. It improves the illumination and general appearance of the laundry, both of which are important factors to good working conditions and the reception of customers.



These gate valves manufactured by The Crane Company, Chicago, are protected against rust and corrosion with aluminum paint.

MANUFACTURED ARTICLES..MACHINERY..TOYS EQUIPMENT..

★ Manufacturers agree that the use of aluminum paint on many articles is a top-notch sales point. It catches the attention of passersby. A "silvery" surface always appeals—giving one the assurance of newness; keeping the product in spick-and-span condition. It is ideal for providing your goods with an attractive and durable coating.

But, of course, the attractive appearance of aluminum paint is only one of its many desirable features. As a protective coating for metal products of all sorts, it is a famous bar to rust; resists corrosion; is enduring in the face of fume, smoke and steam.

Some of the articles, now beautified and safeguarded by aluminum paint, are: cream separators, gas meters, lawn mowers, toys, stoves, washing machines, mail boxes, electrical apparatus, dairy equipment, steel gates, posts, water coolers, tennis racquets, car-stop markers, movie screens and gasoline drums.

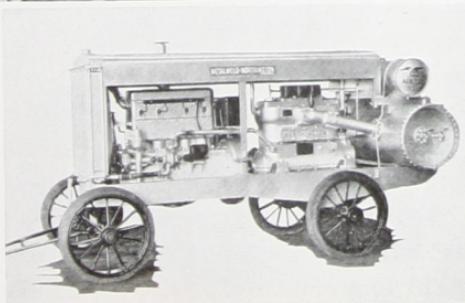
Many products made of wood such as doors, cabinets, cupboards, window sash, etc., are given a coating of aluminum paint. It not only serves as a distinguishing "mark" for the product but it is a most excellent prime-coat for all wooden articles. Many lumber products are now being primed at the mill with aluminum paint.

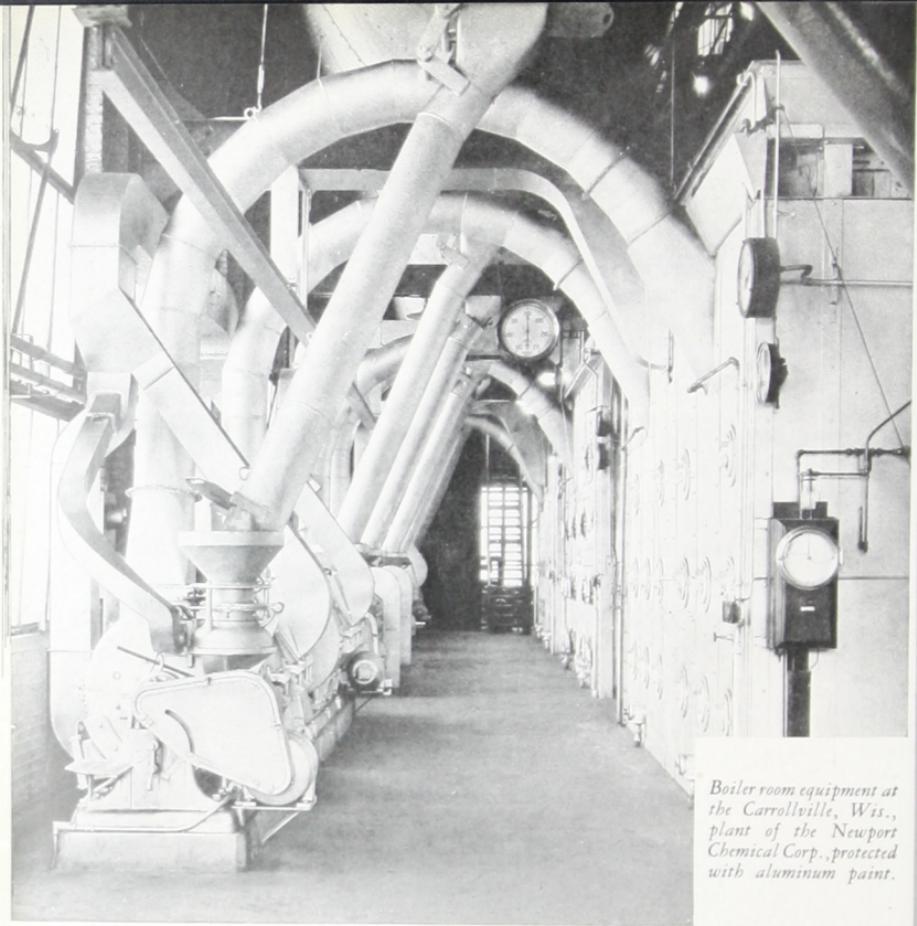
For application, aluminum paint can be brushed or sprayed, giving satisfaction in both cases. It can be baked on metal products—a protective coat of exceptional hardness results. Lacquers can be used, for speeding up production—and if low cost is essential and durability not a factor, gloss oil can be used.



For best appearance and protection, aluminum paint is used on all kinds of small manufactured products such as these conduit boxes.

Two coats of aluminum paint is the standard finish for "Air King" compressors made by Metalweld Company, Inc., Philadelphia.





Boiler room equipment at the Carrollville, Wis., plant of the Newport Chemical Corp., protected with aluminum paint.

HEATED SURFACES

POWER HOUSE EQUIPMENT..MELTING AND
HEAT-TREATING FURNACES

★ Aluminum paint is used to advantage on boiler-room equipment, melting and heat-treating furnaces, steam pipes or, in fact, on any heated surface.

Furnaces operate with greater economy when the exteriors are aluminum-painted. In some cases higher temperatures are attainable, or, if this is not desirable,

the operating temperature may be maintained with less electrical energy than when an ordinary brick or iron surface is employed. The reason for this lies in the ability of aluminum paint to retard the passage of heat from the furnace walls to the surrounding air. An additional important advantage of aluminum paint on furnaces is that it makes working conditions more comfortable because of the reduced heat-flow into the atmosphere.

It will be found that aluminum paint, made with the proper vehicle, can withstand furnace-surface temperatures without breaking down or discoloring. As a result equipment protected with it is not only more economical to operate but has a better appearance even after a long period of use.

When aluminum paint is used throughout—on walls, ceilings, furnaces, pipes, etc., it adds much to the general appearance of the room and greatly increases visibility.

FOUNDRY PATTERNS

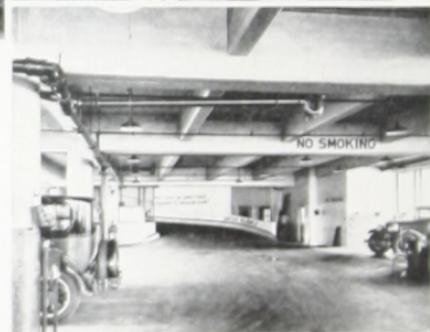
★ As outlined before, aluminum paint has remarkable ability to withstand moisture. This makes it an ideal coat for foundry patterns. Ordinary shellac is used as the vehicle. The aluminum pigment practically prevents the raising of the grain and consequently less sanding is necessary. Fewer coats are required. A coating of this aluminum paint minimizes moisture changes and aids in keeping patterns uniform in shape and dimension.

The surface provided by aluminum paint made with shellac is durable and smooth—sand will not readily adhere to it; patterns come easily from the molds. Also less repairing of molds and less cleaning of patterns are required.



Interior of Pennsylvania Petroleum Products Company's service station in Providence, R. I., painted with aluminum paint.

Aluminum paint on the walls and ceiling of the Cadillac-La Salle service building, Oak Park, Ill., is an aid to illumination and gives the interior a pleasing appearance.



GARAGES AND SERVICE STATIONS

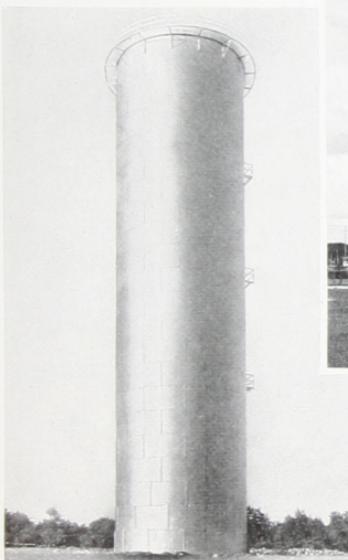
INTERIORS AND EXTERIORS..TANKS AND PUMPS

★ Good lighting is important in both garages and service stations. That is the reason so many of these structures are painted inside with aluminum paint. Corners reflect more light, illumination is better, and the general "tone" of the place is made more pleasing by the metallic luster of this modern paint.

Furthermore, this bright metallic coat is easy to keep clean—stays fresh and bright despite the constant presence of fumes, dust and grease. Used inside, one coat generally suffices, the paint possessing hiding qualities far beyond those of ordinary paint.

Gleaming aluminum paint provides adequate protection from the salt air for this water tank owned by the City of St. Petersburg, Fla.

The City of Randolph, Mass., finds an ally in aluminum paint in protecting this standpipe against rust.



WATER TANKS AND STEEL TOWERS

★ Tanks and towers have an individual need for aluminum paint. Standing, as they do, high above their usual surroundings, with complete exposure to sun, rain and snow, they must have unusual protection. Again, they are often located in out-of-the-way places, where access is difficult.

Then, too, the rich, metallic beauty of this paint is a definite benefit—making water tanks, steel towers and other structures look better and cleaner for a longer period than will ordinary paints. The public notices it; appreciates it. There is no finer way to impress on a community that your equipment is modern and in tip-top shape.



Protected with aluminum paint, these three bridges over the Allegheny River at Pittsburgh are outstanding monuments to civil engineering art.

STATE, COUNTY, AND MUNICIPAL USES

★ There are several good reasons why aluminum paint, made with Alcoa Albron, has been written into standard specifications for municipal property.

In the first place, this metallic paint makes metal or wood surfaces gleam with a rich "silvery" luster which endures through long and severe weather changes. Civic pride finds full expression in "the coat of metal protection"—you'll see it on bridges, lamp posts, flag poles, traffic signals, fire-hydrants, and many types of structures in public parks.

Architects have repeatedly specified aluminum paint for bridges—approving the ability of this paint to harmonize steel members with concrete.

ALUMINUM PAINT

Beauty, however, is not the sole advantage sought by municipalities or civic organizations. Cost must be right; protection must be thorough. Here, again, aluminum paint holds its own, as an investigation will prove. For hiding power, coverage, resistance to moisture, smoke and fumes—this metallic paint meets all the requirements. And as for price—gallon for gallon—aluminum paint costs no more than other good paints.

One big factor, that is always an aid to community betterment, is that the public quickly "takes to" its charm. Once a city has started the beautifying job, private owners are quick to follow with an aluminum coat for their tanks, towers, gas holders, plants. Owners of private residences soon step forth with trellises, benches, fences and other properties dressed in this attractive metallic coating.

Three-light signals, beacons and other traffic control devices are made more visible and blend better with their surroundings when they are aluminum-painted.



Franklin Field Stadium, University of Pennsylvania. All structural members are finished with aluminum paint.

CREOSOTED POLES AND POSTS are more visible when painted with Aluminum Paint » »

POLES

HIGHWAY GUARD-RAILS

FENCE POSTS

★ Public utilities and state highway departments sometimes find it necessary to increase the visibility of certain of their structures built of creosoted material. This is true of highway guard-rail posts, poles and other utility structures found along public right-of-ways. It is not generally practical to use ordinary paints on creosoted wood because the coating soon becomes discolored and loses its visibility. However, often a single coat of aluminum paint will completely hide the creosote color. It retains its bright metallic sheen and thus gives a creosoted post the added quality of high visibility, particularly at night.

The painting should be done after the creosoted lumber has had ample time to weather, as a satisfactory job is not usually obtained when the paint is applied to a freshly creosoted surface. Special vehicles are essential for success in this application.

Correctly used, aluminum paint on creosoted wood offers an economical solution to the problem of visibility. It is easily applied in the field and costs considerably less than some methods resorted to, such as nailing to the pole, vertically, untreated strips of wood which are painted white.



The aluminum-painted ceiling of this lobby in the Rand Tower, Minneapolis, blends nicely with the paneled walls and the elevator doors which are of modern design.



The walls and ceiling of the San Francisco sales room of the Toledo Scale Company are finished with aluminum paint. Borders and ornaments of harmonizing colors complete the decoration.

INTERIOR DECORATION

HOMES . . . OFFICES . . .

RECEPTION ROOMS . . . LOBBIES

★ Aluminum is one of the most effective colors available for decorating modern interiors. It may be used alone or with many harmonizing or contrasting colors such as blue, green or terra cotta. If it is plaster that is to be painted, it should have a sanded or rough surface to obtain the most pleasing results. A roughened effect can be obtained on smooth plaster by stippling. This is done by means of a sponge dipped in a rather thick aluminum paint.

Aside from its decorative value, aluminum paint used as a first coat seals "hot spots" in plaster. Used as a finish coat, it reflects approximately 60 to 70 per cent of the light falling upon it.



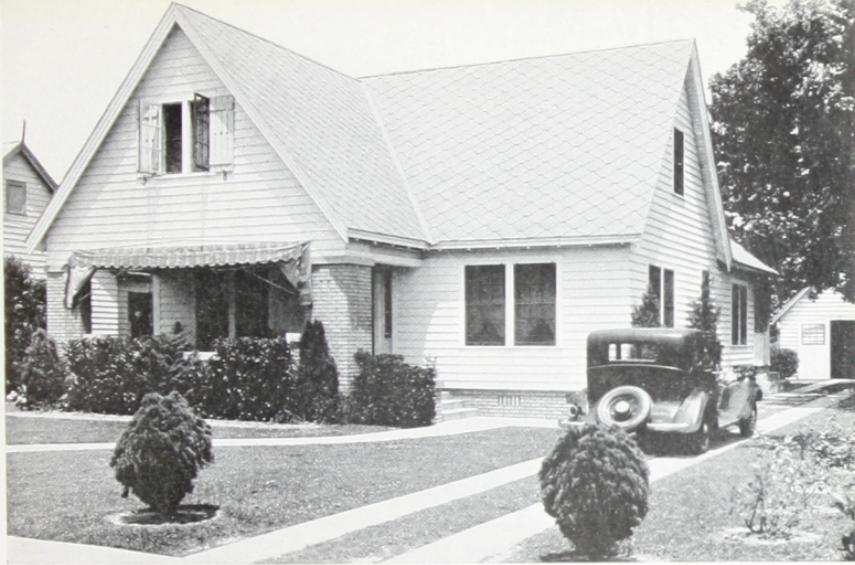
When this summer home was repainted it was given a coat of aluminum paint over which it was intended to apply finish coats. Because of the complete hiding power and beauty of the aluminum paint however, the owner decided to do no further painting. This photograph was taken ten months later.

ALUMINUM PAINT AS A PRIMING COAT ON WOOD

★ In reporting on the study of protective coatings for wood, Dr. F. L. Browne, Senior Chemist of the U. S. Forest Products Laboratory, Madison, Wisconsin, states in an article entitled "How Properties of Wood Determine the Service Given by Exterior Paint Coatings," which appears in the *American Paint Journal*, Volume 14, Number 25:

"The ideal coating for wood, however, ought to remain an adequate protective agent against wood weathering until its appearance is so changed that repainting is clearly necessary and it ought to wear down uniformly over summerwood and springwood alike, being firmly anchored to all parts of the wood when repainting is done. Flaking from summerwood should be unknown. With such a paint, all wood surfaces would give equally satisfactory paint service."

ALUMINUM PAINT



A Mobile, Ala., home built early in 1931 with siding mill-primed with aluminum paint. This photograph taken in June, 1934, shows the excellent condition of the paint after 3 years' exposure.

A good priming coat for wood should enable lumber to give long service and at the same time add to the life of top coats. Such a primer should show equally good adhesion to spring wood and summer wood, and at the same time offer satisfactory "tooth" for succeeding coats. It will also show high resistance to moisture passage not only when newly applied, but also after long weathering and long exposure to the destructive action of sunlight. Although some paints may have good resistance to moisture at first, they are soon broken down by weathering and sunlight and their elasticity destroyed. This permits wide moisture changes to take place in the wood. These changes in moisture content promote rapid shrinking and swelling of the wood surface, resulting in further destruction of the embrittled paint film. A good primer must retain its moisture resistance and elasticity to be effective.

The results of many quantitative measurements show that aluminum paint not only has high initial



A Southern residence built in 1930 with mill-primer siding finished with 2 coats of brown paint. There was still no evidence of paint failure when this picture was taken in June, 1934.

moisture resistance but retains its impermeability better when exposed to the weather than other paints tested.

MOISTURE-PROOFING EFFICIENCY OF VARIOUS PAINTS

Measurements made from panels exposed at an angle of 45° facing South.

COATING	MOISTURE-PROOFING EFFICIENCY PER CENT			
	Initial	After 1 year's Exposure	After 2 years' Exposure	After 3 years' Exposure
1 Coat Aluminum Paint and 2 Coats White Lead.	81	81	75	66
1 Coat Aluminum Paint and 2 Coats Lead-Zinc Paint.	83	84	80	65
3 Coats White Lead	71	76	66	46
3 Coats Lead-Zinc Paint...	72	77	69	43
1 Coat Varnish and				
2 Coats White Lead.....	64	77	54	35

The "leafed" metallic pigment of aluminum paint accounts for many of its valuable properties. The unique arrangement of the metal flakes, layer upon layer throughout the paint film, makes moisture pene-

ALUMINUM PAINT

tration extremely difficult. These opaque flakes further contribute to the paint's durability by stopping and reflecting the harmful sun rays, the penetration of which is the principal cause of eventual paint failure. Aluminum primers, because they maintain their elasticity, adhere more uniformly to both spring wood and summer wood, and provide a good "tooth" for the adherence of top coats. It is because of these qualities that aluminum paint is recognized as an unequalled priming coat for wood. It not only adds life to top coats but also aids in maintaining their good appearance.

Wood has always been and will continue to be an important construction material despite the fact that many new building materials have been introduced during the past few years. Its low cost is an important consideration and furthermore it lends itself readily



Two vertical test panels made of Southern yellow pine. The right hand panel was primed with a good grade of white paint, while the left hand panel was primed with aluminum paint. Two top coats of paint were then applied to both. This photograph shows the condition of the paint after 3 years' exposure.



Apartment house built of mill-primed siding.

to architectural design. Properly protected it is long lived. This is the reason why the selection of a satisfactory primer is of so much importance.

The usual practice is to prime lumber after the building has been erected. Aluminum paint applied to the weather-exposed surfaces only, offers considerable protection to the wood against the effects of moisture, and the integrity and beauty of the finish is maintained for a long time. Of still greater value is the practice of painting the lumber on all sides with a coat of aluminum paint. Each board is thus "sealed" with a coat of metal protection, with the result that moisture changes in the wood are still further reduced.

Back-painting of lumber may be performed by painters on the job or at the mill. In the latter case each board is protected against rapid moisture changes during transit and storage. Mill-priming has a number of advantages over priming in the field, and mill-primed lumber is available in many forms. Such products as drop- and bevel-siding, ceiling, flooring, gutters and most other kinds of mill work are being pro-



Applying top coats over a priming coat of aluminum paint. Note the uniformity of color and complete hiding power of the aluminum prime coat.

tected in this way immediately following the kiln-drying or seasoning process. Seasoned wood, as it leaves the mill, normally has the correct moisture content, and, protected with a coat of aluminum paint, it arrives at the job in practically the same condition as it left the mill. Furthermore, it is ready for the top coats which may be applied with greater assurance of a more satisfactory and better appearing paint job.

Blistering and peeling of newly applied paint coatings and the bleeding through of discoloring stains are minimized because the unexposed surfaces, ordinarily not painted, are now protected against the excess moisture which is usually present in newly-built homes. It must be remembered, however, that mill-primed lumber will not overcome all of the paint difficulties arising from faulty building construction.

The practice of mill-priming and back-painting with aluminum paint are having a marked influence on the use of wood. Lumber, so protected, is a better building product and will give longer trouble-free service.



BEFORE PAINTING: One of nearly 200 houses which were reconditioned with aluminum paint for the Alan Wood Iron & Steel Company, Oxford, N. J.

HOME MAINTENANCE

GENERAL REPAIRING... ATTICS AND CELLARS

GARDEN FURNITURE... GARAGE INTERIORS

★ For the maintenance of both individually owned homes as well as entire villages owned by industrial concerns, aluminum paint is being used as the one all-purpose protective coating. Its value as a priming coat on wood is generally recognized, and some property owners have also used it for the finish coats on home exteriors.

A single coat of aluminum paint on the walls and ceilings of basements and attics will make a surprising difference. It gives a cheery brightness to any dark room or stairway. The furnace, piping and water tanks also should have this "coat of metal protec-

ALUMINUM PAINT



AFTER PAINTING: *The same house after one coat of aluminum paint had been applied. The trim is in dark green and the window sashes are painted white.*

tion." For "touching-up" miscellaneous articles, every home owner should keep a can of aluminum paint handy. It will contribute to a bright, cleanly tidiness.

Outside the house there are many suitable places for this additional beauty and protection. For instance, fences, trellises, summer houses, swings, sand boxes and flag poles are instantly given a harmonious, modern charm that is noticeable to everyone. The metallic luster is lasting because aluminum paint holds its color. Benches and other garden furniture painted with it become silvery highspots against a background of greenery.

Inside the garage, a single coat of aluminum paint is enough to brighten up the place and protect the surface. If the entire interior is aluminum-painted, it can be kept clean by washing down with a hose.



The aluminum-painted barn and double silo make the Southcott Bros. Farm, near N. Prairie, Wisc., a well-known landmark.

F A R M S B U I L D I N G S . . . F E N C E S M A C H I N E R Y . . .

★ Unless their equipment is properly protected, farmers pay a heavy annual bill to rusting metal and weathering wood. Aluminum paint used on buildings, silos, ventilators, machinery, posts and other kinds of equipment will eliminate a large part of this loss. Machinery is often exposed to all kinds of weather and needs the protection offered by this metallic pigment paint.

Inside the barn, where work is carried on early in the morning and in the evening, visibility can be increased by the use of aluminum paint which has good light-reflecting qualities. This paint will also withstand the atmospheres found in barns, poultry houses and other such buildings.

There is scarcely an article or piece of equipment about the farm that does not need the protection against the elements offered by aluminum paint—the paint which has a high resistance to moisture because its metallic pigment "leafs."

SPECIFICATIONS . . . FOR ALUMINUM PAINT

INSTRUCTIONS FOR USE

1. Mixing: Aluminum paint shall be freshly mixed and only enough for one day's use shall be mixed at one time. Any paint remaining after this period may be mixed with freshly prepared paint, if it does not exceed 10% of total newly-mixed paint. The paint shall be mixed in the proportion of 2 pounds of Alcoa Albron Powder or Alcoa Albron Paste per gallon of vehicle, or as otherwise specified. The weighed amount of pigment shall be placed in a suitable mixing container, and a measured volume of vehicle shall be *gradually* added to it with continuous stirring until a uniform paint is obtained. Each time any paint is removed from the mixing container, the paint shall again be thoroughly stirred to insure proper mixing. The paint shall also be frequently stirred during use.

2. Application: Aluminum paint may be applied with either spray gun or hand brush. If spraying equipment is employed, only sufficient pressure should be used to secure adequate atomization. Excessive pressure should be avoided. For spraying purposes, thinners may be added as required but not to exceed 10% of the total volume of paint. If a brush is used, care should be taken that all final brush strokes are made in the same direction. Excessive brushing will result in streaking and darkening, and should be avoided.

3. Painting Weather-Exposed Steel—New Work: The steel surface to be painted shall be thoroughly clean and dry. Oil and grease shall be removed with mineral spirits. Rust, mill scale, dirt or other foreign matter shall be removed by scratch-brushing, scraping or sand-blasting. No painting shall be done in wet weather or when the temperature is below 40° F. or when there is frost or moisture condensation on the steel. At temperatures below 50° F., the use of a maximum of 10% thinner, such as mineral spirits, is permissible. A good rust inhibitive priming coat shall be applied and allowed to dry for at least 48 hours.

Two coats* of aluminum paint made with Alcoa Albron Powder or Paste and Long Oil Varnish as specified in Paragraphs 12, 13 or 14, shall then be applied over the priming coat, allowing at least 48 hours drying time between coats.

4. Painting Weather-Exposed Steel—Old Work: The steel surface shall be free from rust, loose paint, loosely adhering mill scale, dirt and other foreign matter. Oil and grease shall be removed with mineral spirits. No painting shall be done in wet weather or when the temperature is below 40° F. or when there is frost or moisture condensation on the steel. At temperatures below 50° F. the use of a maximum of 10% thinner, such as mineral spirits, is permissible. All bare spots shall be touched up with a good rust inhibitive priming paint. Two coats* of aluminum paint made with Alcoa Albron Powder or Paste and Long Oil Varnish as specified in Paragraphs 12, 13 or 14 shall then be applied, allowing at least 48 hours drying time between coats.

5. Painting Weather-Exposed Wood—New Work: The surface to be painted shall be thoroughly clean and dry. No painting shall be done in wet or freezing weather or within 24 hours following a rain. A priming coat of aluminum paint shall be applied over the entire surface. The paint shall consist of 1½ pounds of Alcoa Albron Powder or 2 pounds of Alcoa Albron Paste per gallon of the varnish vehicle for wood (Very Long Oil Varnish), as specified in Paragraph 16 or the vehicles described in Paragraphs 13 or 14. Cracks as well as counter sunk nailheads shall be filled with a good putty before additional paint coats are applied. If 2 coats of aluminum paint are specified, the second coat shall consist of a paint made with 2 pounds of Alcoa Albron Powder or Paste per gallon of vehicle. At least 48 hours drying time shall be allowed between coats. Other top coats may be used as specified, allowing the same drying time.

6. Painting Weather-Exposed Wood—Repaint Work: The surface to be painted shall be scraped and scratch-brushed to remove blistered or loosely adhering paint and then thoroughly dusted. Cracks shall be filled with putty. No painting shall be done in wet or freezing weather or within 24 hours following a rain. A first coat of aluminum paint made with 2 pounds of Alcoa Albron Powder or Paste per gallon of the varnish vehicle for

*The first coat of aluminum paint may be tinted with Prussian Blue. Two ounces of Prussian Blue paste shall be added to each gallon of the clear vehicle before mixing with the aluminum pigment.

wood (Very Long Oil Varnish), as specified in Paragraph 16 or the vehicles described in Paragraphs 13 or 14, shall then be applied. A drying time of at least 48 hours shall be allowed before top coats of paint are applied. If 2 coats of aluminum paint are specified, the second coat shall consist of a paint made with 2 pounds of Alcoa Albron Powder or Paste per gallon of vehicle. Other top coats may be used as specified, allowing the same drying time.

7. Painting Wood—Interior: If the wood has previously been painted with a high gloss finish, the surface should be sanded before any paint is applied. (This applies particularly to interior trim). The aluminum paint shall consist of Alcoa Albron Powder or Paste mixed with the Interior Varnish, as specified in Paragraph 15, in the proportions of $1\frac{1}{2}$ pounds per gallon of vehicle. If the work is specified to be left in the aluminum finish, 2 coats of the same aluminum paint shall be applied, allowing at least 48 hours drying time between coats.

8. Painting Brick, Concrete and Plaster: The surface to be painted shall be dry and free from all loose paint, dirt and calcimine. The paint shall consist of $1\frac{1}{2}$ pounds to 2 pounds of Alcoa Albron Powder or Paste per gallon of a varnish vehicle, as specified in Paragraphs 12, 13 or 15. If the surfaces are exposed to the weather, 2 coats of aluminum paint shall be applied, using 2 pounds of pigment per gallon of vehicle for the second coat, and allowing at least 48 hours drying time between coats. For interiors, one coat may be sufficient.

9a. General Interior Work: For ordinary interior work, one coat of aluminum paint is usually sufficient. The paint shall consist of $1\frac{1}{2}$ pounds to 2 pounds of Alcoa Albron Powder or Paste per gallon of the Interior Varnish specified in Paragraph 15.

9b. For Interiors Exposed to Unusual Conditions: Where unusual exposure conditions exist, such as acid fumes, high humidity, etc., all steel to be painted shall have a rust inhibitive priming coat applied. Two coats of aluminum paint, using the varnishes specified in Paragraphs 13 or 14, mixed with 2 pounds of Alcoa Albron Powder or $2\frac{1}{2}$ pounds of Alcoa Albron Paste per gallon of vehicle shall then be applied over the priming coat. Two coats of the same aluminum paint shall be applied on all other surfaces. The painting procedure described in Paragraphs 2 to 6 shall be followed.

10. Painting Metal Surfaces Subject to High Temperatures:

In painting metal surfaces which reach high temperatures, special care shall be taken to insure a clean surface. A roughened surface will also improve the adherence of the aluminum paint film. For surfaces which reach temperatures in excess of 400° F., an aluminum paint consisting of Alcoa Albron Powder or Paste mixed with a Heat-Resisting Vehicle, such as described in Paragraph 18, in the proportion of 2 pounds to 3 pounds of pigment per gallon of vehicle shall be applied. For surfaces, the temperature of which does not exceed 400° F., Spar Varnish, as described in Paragraph 12, may be used as the vehicle if diluted with at least 50%, by volume, with thinner such as mineral spirits. *The above recommendations do not apply to heated surfaces exposed to the weather such as unlined stacks or stack breachings.*

C O M P O S I T I O N

11. Pigment: The pigment portion of the aluminum paint shall consist of Alcoa Albron Powder (aluminum bronze powder) or Alcoa Albron Paste (aluminum paste) manufactured by Aluminum Company of America.

a. Aluminum Bronze Powder: The aluminum bronze powder shall be Standard Varnish Alcoa Albron Powder. A finer grade known as Standard Lining Alcoa Albron Powder may be substituted for the Standard Varnish grade in these specifications, where greater smoothness of finish is desired. When the finer grade is employed, the powder proportion of the paint may be reduced 15% to 25% depending upon the durability required.

b. Aluminum Paste: The aluminum paste shall be Alcoa Albron Paste, which contains a fine mesh powder similar to Standard Lining Alcoa Albron Powder. Two pounds of paste per gallon of vehicle shall be used for all general exterior applications. For the most durable results, 2½ pounds of paste per gallon of vehicle shall be used.

12. Vehicle—Long Oil Varnish: The vehicle for use on weather-exposed steel or other metals, brick, concrete and plaster shall consist of a long oil varnish, made from ester gum, cumarone-indene, Amberol B1 or F7 or other suitable resins, together with suitable drying oils, and shall fulfill the following requirements:

a. The varnish shall be clear and transparent.

- b. The viscosity shall be between 0.50 and 1.0 poise at 25° C., corresponding to Tubes A to D of the Gardner-Holdt Air Bubble Viscometer, if it is to be used with Alcoa Albron Powder, or between 0.65 and 1.25 poises at 25° C., corresponding to Tubes B to E if it is to be used with Alcoa Albron Paste.
- c. It shall contain not less than 50% by weight of non-volatile oils and gums.
- d. It shall pass a 60% Kauri Reduction Test as described in Federal Specification TT-V-81, Paragraph F-2g.
- e. When thoroughly mixed with Alcoa Albron Powder or Paste in the proportion of 2 pounds per gallon of vehicle, the paint shall have good leafing quality, show satisfactory brushing and leveling properties and shall not break or sag when applied to a vertical, smooth, steel surface.
- f. The *paint* shall set to touch in not less than 1 hour nor more than 6 hours and dry hard and tough in not more than 24 hours at a temperature of 20° C. to 30° C., except where it is to be used on brick, concrete or plaster, in which case, the *paint* shall set to touch in 1 to 3 hours and dry hard and tough in not more than 18 hours at the same temperature.

13. Vehicle—Phenolic Resin Base Varnish: This specification is designed to cover a long oil phenolic resin varnish of maximum elasticity and durability for use in making aluminum paint for all exterior applications.

- a. The oil shall be entirely vegetable oil, containing not less than 75% China wood oil. The volatile thinner shall be free from toxic hydrocarbons such as benzol.
- b. It shall be clear and transparent.
- c. The viscosity shall be between 0.50 and 1.0 poise at 25° C., corresponding to Tubes A to D of the Gardner-Holdt Air Bubble Viscometer, if it is to be used with Alcoa Albron Powder, or between 0.65 and 1.25 poises at 25° C., corresponding to Tubes B to E if it is to be used with Alcoa Albron Paste.
- d. The flash point shall not be below 30° C. in a closed cup tester.
- e. The varnish shall contain not less than 50% by weight of non-volatile oils and resin.

f. It shall pass a 140% Kauri Reduction Test, using the method described in Federal Specification TT-V-81, Paragraph F-2g.

g. It shall show no skinning after 48 hours in a three-quarters filled, tightly closed container.

h. It shall pass the gas and draft tests as described in U. S. Navy Specification 52V-14a.

i. Flow-out films on tin plate panels dried 72 hours shall withstand immersion in cold water for 96 hours and hot water (77° C.) for 6 hours without whitening, dulling, checking, or showing other serious defect.

j. Films applied to 6" x 1" test tubes by immersion in varnish to a depth of 4 inches and dried in an inverted position for 72 hours shall show no whitening, dulling or visible attack when immersed to a depth of 2 inches in a 5% solution of sodium-hydroxide for six hours (at 20° C.) and (a separate similar film) a 4% solution of acetic acid for 24 hours (at 20° C.).

k. When thoroughly mixed with Alcoa Albron Powder or Paste in the proportion of 2 pounds per gallon of vehicle, the paint shall have good leafing quality, show satisfactory brushing and leveling properties and shall not break or sag when applied to a vertical, smooth, steel surface.

l. Aluminum *paint* made with this varnish, when applied to a metal panel and allowed to dry in a vertical position, shall set to touch in not more than 2 hours and dry hard and tough in not more than 18 hours at a temperature of 20° C. to 30° C.

14. Vehicle—Glycerol-Phthalate Resin Base Varnish: This specification is designed to cover a glycerol-phthalate resin varnish of maximum elasticity and durability for use in making aluminum paint for all exterior applications.

a. The varnish shall consist of glycerol-phthalate and suitable modifying agents, and properly thinned to yield a good working material.

b. It shall be clear and transparent.

c. It shall be no darker than a solution of 0.9 gram of potassium-dichromate in 100 cc of sulfuric acid, specific gravity 1.84. (No. 6 on the Hellige Comparator).

d. The viscosity shall be between 0.50 and 1.0 poise at 25° C., corresponding to Tubes A to D of the Gardner-Holdt Air Bubble Viscometer, if it is to be used with Alcoa Albron Powder, or between 0.65 and 1.25 poises at 25° C., corresponding to Tubes B to E if it is to be used with Alcoa Albron Paste.

e. The varnish shall contain not less than 48% by weight of non-volatile matter.

f. A flow-out film of the varnish on 28 gauge tin plate, air dried 16 hours and then baked at 180° C. to 185° C. for 2 hours, shall show no cracking of the film when suddenly chilled to 0° C. and quickly bent sharply on itself. The bent part of the baked panel shall show satisfactory adhesion under a knife test.

g. A flow-out film on colorless glass, baked for not less than 2 hours at 180° C. to 185° C., shall be hard, tough, smooth, transparent and free from all defects such as checking, dulling, or wrinkling when compared to a fresh film.

h. It shall show no skinning after one week in a half-filled, tightly closed glass container stored in a dark place.

i. A flow-out film on 28 gauge tin plate, air dried for 48 hours, shall withstand immersion in cold water for 18 hours without whitening and shall show only slight dulling. A similar film shall withstand boiling water for 10 minutes without appreciable whitening or dulling and shall show no whitening after drying for 15 minutes. After removal from the water for 30 minutes, the original gloss and hardness shall return in both instances.

j. A flow-out film on 28 gauge tin plate, air dried 48 hours, shall retain its gloss and general appearance after 24 hours immersion in straight cut gasoline. After air drying 4 hours, the film shall have regained its initial hardness and toughness. There shall be no dissolution effect on the lower immersed edge.

k. When thoroughly mixed with Alcoa Albron Powder or Paste in the proportion of 2 pounds per gallon of vehicle, the paint shall have good leafing quality, show satisfactory brushing and leveling properties and shall not break or sag, when applied to a vertical, smooth, steel surface.

l. Aluminum *paint* made with this varnish, when applied to a metal panel and allowed to dry in a vertical position,

shall set to touch in not more than 3 hours and dry hard and firm in not more than 16 hours at a temperature of 20° C. to 30° C.

15. *Vehicle—Interior Varnish:* The vehicle for general use on steel or other metals, brick, concrete or plaster subject to interior exposure shall consist of a varnish, fulfilling the following requirements:

- a. The varnish shall be clear and transparent.
- b. The viscosity shall be between 0.50 and 1.0 poise at 25° C., corresponding to Tubes A to D of the Gardner-Holdt Air Bubble Viscometer.
- c. It shall contain not less than 45% by weight of non-volatile oils and gums.
- d. It shall pass a zero % Kauri Reduction Test, using the method described in Federal Specification TT-V-71, paragraph F-2f.
- e. When thoroughly mixed with Alcoa Albron Powder or Paste in the proportion of 2 pounds per gallon of vehicle, the paint shall have good leafing quality, show satisfactory brushing and leveling properties and shall not break or sag when applied to a vertical, smooth, steel surface.
- f. The paint shall set to touch in not more than 2 hours and dry hard and tough in not more than 18 hours at a temperature of 20° C. to 30° C.

16. *Vehicle—Varnish Vehicle for Wood (Very Long Oil Varnish):* The vehicle for use on weather-exposed wood shall consist of a very long oil varnish, fulfilling the following requirements:

- a. The varnish shall be clear and transparent.
- b. The viscosity shall be between 0.50 and 0.85 poise at 25° C., corresponding to Tubes A to C of the Gardner-Holdt Air Bubble Viscometer, if it is to be used with Alcoa Albron Powder, or between 0.65 and 1.0 poise at 25° C., corresponding to Tubes B to D if it is to be used with Alcoa Albron Paste.
- c. It shall contain not less than 50% by weight of non-volatile oils and gums.
- d. It shall pass a 100% Kauri Reduction Test, using the method described in Federal Specification TT-V-81, Paragraph F-2g.

e. When thoroughly mixed with Alcoa Albron Powder or Paste in the proportion of 2 pounds per gallon of vehicle, the paint shall have good leafing quality, show satisfactory brushing and leveling properties and shall not break or sag when applied to a vertical, smooth, wood surface.

f. The *paint* shall set to touch in not less than 3 hours nor more than 8 hours and dry hard in not more than 24 hours at a temperature of 20° C. to 30° C.

17. *For Wood Not Exposed to Weather:* The vehicle for aluminum paint described in Paragraphs 12 or 15 may be used.

18. *Vehicle—For High Temperature Work:* Requirements for this type of vehicle shall be largely performance requirements, the composition being left entirely to the manufacturer, but fulfilling the following specification:

a. The vehicle shall contain not less than 20% non-volatile matter.

b. The viscosity shall be not greater than 0.50 poise, corresponding to Tube A of the Gardner-Holdt Air Bubble Viscometer.

c. When thoroughly mixed with Alcoa Albron Powder or Paste in the proportion of 2½ pounds per gallon of vehicle, the paint shall have good color and show satisfactory adherence to a smooth 26 gauge black iron panel and shall not crack nor peel when the panel is bent over a ¼-inch rod through an angle of 180°, after 10 hours heating of the panel at 500° C.

19. *Vehicles—Miscellaneous:* Other meritorious vehicles such as bituminous and asphalt base varnishes, pyroxylin lacquers, etc., have not been included in these specifications because of the proprietary nature of their formulas. The valuable properties of such vehicles make them particularly well adapted for many special services where the varnish type of vehicle is not suitable.

ALUMINUM COMPANY OF AMERICA

SALES OFFICES



ALBANY, N. Y.	90 State Street
ATLANTA, GA.	1818 Rhodes-Haverty Building
BIRMINGHAM, ALA.	1112 Martin Building
BOSTON, MASS.	20 Providence Street, Park Square
BUFFALO, N. Y.	1880 Elmwood Avenue
CHICAGO, ILL.	520 N. Michigan Boulevard
CINCINNATI, OHIO.	903 Dixie Terminal Building
CLEVELAND, OHIO.	2210 Harvard Avenue
DALLAS, TEXAS.	1601 Allen Building
DETROIT, MICH.	3311 Dunn Road
FAIRFIELD, CONN.	Boston Post Road
HARTFORD, CONN.	Capitol Building
HOUSTON, TEXAS.	1644 W. Alabama Street
INDIANAPOLIS, IND.	716 Merchants Bank Building
KANSAS CITY, MO.	2306 Power & Light Building
LOS ANGELES, CALIF.	1031 S. Broadway
MILWAUKEE, WIS.	735 N. Water Street
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NEWARK, N. J.	1111 Academy Building
NEW ORLEANS, LA.	925 Pere Marquette Building
NEW YORK, N. Y.	230 Park Avenue
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PITTSBURGH, PA.	Gulf Building
SAN FRANCISCO, CALIF.	709 Rialto Building
ST. LOUIS, MO.	1825 Boatmen's Bank Building
SEATTLE, WASH.	1005 White Building
TOLEDO, OHIO.	1315 Ohio Bank Building
WASHINGTON, D. C.	605-612 Southern Building

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